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ABSTRACT

The study integrates various elements of past approaches to job design. It focuses on determining individual characteristics associated with performance and work satisfaction on a simulated maintenance task designed to be seen as low in job structural attributes (LJSA) by one group and the same task designed to be perceived as high in job structural attributes (HJSA) by a second group of subjects. Simple and multiple associations of quantity, quality, and satisfaction of individual differences in ability, personality, and preference measures were examined under these two manipulated job characteristic conditions. A sample of 26 male and 34 female undergraduate students, divided into low and high condition groups, participated in the experiment which consisted of three phases: (1) test battery designed to measure general and specific abilities, (2) the Rod and Frame Test and the Attribute Preference Scale, and (3) the actual experimental task. The results indicated that the psychologically manipulated expectations of task structural attributes moderated the relationships between ability measures and both quantity and quality of performance and task satisfaction. The data are presented in 49 tables. Appended materials include a list of references and additional tables. (Author/EC)

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Technical Report 5

The Relationship Between Individual Attributes and Job Design: Maintenance Tasks

Gerald V. Barrett, Edward J. O'Connor,
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The University of Akron

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Abstract

Report of a study of a simulated maintenance task in which subjects worked under two different sets of expectation. In the high job structural attribute condition subjects were told that the maintenance task was high in responsibility, feedback, and the opportunity to learn new skills. In the low job structural attribute condition, they were told that the task was low on these attributes. However, subjects in both conditions completed the same physical task during the experimental session. The results indicated that those psychologically manipulated expectations of task structural attributes moderated the relationships between ability measures and both quantity and quality of performance and task satisfaction.

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Introduction

Substantial interest and concern currently exists regarding the process and consequences of job design programs in organizations. Early practitioners, following scientific management (Taylor, 1911), concentrated on identifying the one best way to design jobs consistent with the constraining physical capacities of the workers. In contrast, the human relations movement (Herzberg, 1966; Walker & Guest, 1952) assumed that individual differences would not interact with task characteristics. Therefore, these proponents emphasized the benefits for all of enlarged versus simplified jobs. More comprehensive job design investigations have focused on outcomes resulting from the interaction of task characteristics and either sociological group differences (Turner & Lawrence, 1965) or individuals' perceptions of their desires for higher order need satisfaction (Hackman & Lawler, 1971).

Past investigations have typically failed to incorporate and examine a substantive range of individual abilities and personality/preference measures as they interact with task characteristics in producing organizational and individual outcomes. Although the consequential interaction of subject and situational variables has been recognized (Scott, 1967), limited models, incorporating only selected subsets of these potentially relevant variables, have typically been employed. Recent investigations (Rose, Fingerman, Wheaton, Eisner &

Kramer, 1974) provided evidence indicating that different ability profiles are associated with desirable performance across variations in manipulated task characteristics. Fingerman, Eisner, Rose, Wheaton, and Cohen (1975) also have found differences in the abilities which relate to performance as a function of variations in task characteristics. In explanation, Fingerman et al. (1975) have argued that variations in certain task characteristics change the properties of jobs such that subjects alter their approaches for dealing with those tasks. These task variations and resulting strategy changes are believed to necessitate variations in abilities in order to achieve positive productive outcomes.

Controlled experimental work has also been noticeably lacking in the job design field (Barrett, Dambrot & Smith, 1975). The laboratory study described in this report has addressed these past weaknesses by measuring a wide range of individual differences for two psychologically manipulated job design levels. The job structural variables of responsibility, feedback, and learning new skills were selected for manipulation based on an earlier literature review and field study information indicating their perceived importance for maintenance task incumbents (Barrett, Bass, O'Connor, Alexander, Forbes & Cascio, 1975). The research has focused on determining the individual characteristics associated with performance and work satisfaction on a task designed to be seen as low in job structural attributes by one group and the same task designed to be perceived as high in job structural attributes for a second group of subjects.

The study examines both single and multiple associations of quantity, quality, and satisfaction with individual differences in ability, personality and preference measures under these two manipulated job characteristic conditions. Findings encompass both direct relationships among individual difference and outcome variables and associations of subject characteristics with decrements in performance over time.

It was expected that different combinations of individual attributes would be predictive of performance and satisfaction on the two tasks (Barrett, Forbes, Alexander, O'Connor & Balascoe, 1975; Fingerman et al., 1975; Rose et al., 1974). Further efforts were focused on identifying profiles of individual differences which related to preferences for task characteristics and to the manner in which subjects described the manipulated tasks.

Method

Subjects

The subjects were 60 (26 male and 34 female) undergraduate students from the University of Akron who volunteered to participate in a psychology experiment for $2.00 per hour. Students, after responding to an advertisement in the school newspaper, were divided into two experimental groups, ten males and 20 females in the low condition and 16 males and 14 females in the high condition.

Experimental Criterion Task

While working on the experimental tasks, subjects were seated at one of four booths located side by side. Each booth

provided a working surface measuring 62 x 120 cm. placed 75 cm. above the floor. Each booth was enclosed (front and both sides) by wood partitions 214 cm. high with the side partitions extending 60 cm. back from the working surface, making it difficult for any subject to determine the rate at which other individuals were working. Participants were seated on soft swival armless chairs approximately 52 cm. above the floor. In addition to containing the experimental materials described below, each work surface contained a seven-button response console.

The experimental task consisted of locating malfunctioning components (cards with an incorrect pattern of holes in one of fifteen punched columns) in each of a series of computer card decks representing simulated electronics equipment. Each deck consisted of 10 green "Malfunction Symptom Cards," 240 white "Component" cards, and 240 blue "Circuit" cards. Each card was identified by a four-column letter/number combination punched and printed in the left-hand columns. The remainder of each card, although punched, contained no printed information. Each of the green Malfunction Symptom Cards had three holes punched in each of 15 randomly chosen columns while the white component and blue circuit cards had two holes and one hole respectively punched in each of 15 randomly chosen columns. For all cards, the pattern of punches inserted in any given column were also chosen randomly.

Twenty-seven 490-card decks were prepared for each of the four work booths before experimental data was collected. For

each booth, all these decks were identical with the exception of a varying series of error cards inserted in each deck. While all decks contained errors in four of the 10 green cards, one of each six-deck sequence presented to subjects contained no incorrect punches in either the white or blue sections. The remaining five decks in each six-deck sequence contained between two and six error cards distributed throughout the white and blue sections. Randomization, within the sequential constraints outlined above, was employed in distributing the number of error cards within each six-deck pattern.

Although the white cards worked on in each booth differed, the variations were random. Held constant across subjects were the sequence of decks presented as determined by the number of error cards involved, the number of cards per deck, and the location within decks of each error card in terms of its distance from the front of its deck, and number of other cards requiring previous attention before it could be located. The green, white, and blue sections of all decks presented to all subjects were identical with the exception of the inserted series of planned errors discussed above. In addition, the four 310-card pink equipment test decks provided (one per subject) were similar for all subjects containing correct pink copies of the 10 green and 240 blue card section. The pink test deck, however, contained cards comparable only to those white components each subject needed to perform his special area of maintenance work.

Experimental Design

The design consisted of two levels of job structural attributes. In the low job structural attribute condition,

participants were given a task with psychologically manipulated low levels of responsibility, feedback, and opportunity to learn new skills. In the high job structural attribute treatment, it was suggested that substantive amounts of these attributes were present. These manipulations were presented as part of the written task instructions (Appendix A) reinforced by message cards inserted in equipment decks and further emphasized by written comments read by the experimenter during training.

Responsibility was manipulated by indicating to participants in the low condition that they could correct malfunctions in only a limited subsection of the total equipment decks making them only partially accountable for whether malfunctions were fully repaired. In contrast, high condition subjects were led to believe that they were fully responsible for whether malfunctions were corrected since they had the expertise and test equipment needed to cope with any potential malfunctions.

Feedback was manipulated by informing low attribute participants that the extensive time required to test the suggested repairs in all equipment decks made it impossible to provide them with feedback on their performance. High job structural attribute subjects, however, were instructed that the jobs they examined could be tested immediately upon completion of maintenance work and that they would therefore be provided with information regarding the amount and quality of their performance relative to other subjects.

The low level of learning new skills was induced by informing student subjects that the task they were about to perform was routine and repetitive in nature, making it improbable that they would learn anything that would be useful to them in their personal lives. In contrast, high condition participants were informed that the job provided a unique opportunity to learn a valuable systematic approach to problem solving which could be generalized to other areas of their personal lives.

Procedure

Subjects reported on three consecutive days for three phases of the experiment. On the first day, subjects were given a test battery designed to measure general and specific abilities, as well as personality variables, work orientation, motivation, and preferences for job attributes. Specifically, the test battery consisted of the Wesman Personnel Classification Test (Wesman, 1965), the Group Embedded Figures Test (Witkin, Oltman, Raskin & Karp, 1971), the Maudsley Personality Inventory (Knapp, 1962), the Hand Skills Test (Kipnis, 1962), the Protestant Ethic Scale (Blood, 1969), the Job Orientation Inventory (Blood, 1973), the Job Attitude Scale (Saleh, 1964, 1971), the Orientation Inventory (Bass, 1967), the Survey of Work Values (Wollack, Goodale, Wijting & Smith, 1971), the Picture Arrangement Test (Tomkins & Miner, 1957), and a Biographical Information Blank and Future Autobiography described in Barrett, Bass, O'Connor, Alexander, Forbes, and Cascio (1975).

On the second day, subjects were given the Rod and Frame Test (Witkin, Lewis, Hertzman, Machover, Meissner & Wapner, 1954) and the Attribute Preference Scale, a measure of preference for job structural attributes (Barrett, Bass, O'Connor, Alexander, Forbes & Cascio, 1975). They were then seated at their booths and given the instructions for the maintenance task.

As initial training, subjects read a 16-page Task Procedure Booklet which contained all information necessary to complete the task, along with introductory and concluding sections presenting the psychological manipulation of responsibility, feedback, and learning new skills.

After reading the Task Procedure Booklets, participants worked their way through two typical example jobs under the guidance of the experimenter. The written instructions read aloud by the experimenter during this part of the training session contained restatements of the critical information needed by the participants to complete the tasks as well as reinforced emphasis of the manipulations employed. Following the approach suggested by Aronson and Carlsmith (1968), the experimenter attempted to insure that the participants possessed at least the minimum understanding of the instructions needed to complete work on the jobs presented. When necessary, special instructions or demonstrations were provided in an attempt to achieve this needed minimum level of competence.

The actual experimental task was run on the third day. Participants were seated at their booths and given a four-minute

version of the Hand Skills Test (Kipnis, 1962). They then were asked to review the task instructions and remove their watches while working on the task.

During the three-hour experimental session, participants worked at their own chosen pace while searching for malfunctions in the simulated electronics equipment represented by computer card decks. The experimenter's task included maintaining a backlog of between one and three jobs to be worked on for each subject.

Detection of malfunctions in equipment decks required adherence to the multistage procedure described in the task procedure instructions. Errors detected were recorded by the participants on "Problems Detected Sheets" (Appendix E). The rate at which participants worked was also recorded throughout the three-hour sessions. Participants provided this information by pressing button 1 on their response button console when they began each job and button 7 when they finished each job. The resulting information was preserved on a Lafayette Recorder (Model 76103) for later analysis.

Magnitude estimations of the amount of time spent working on individual jobs were collected during the fifth, ninth, thirteenth, and nineteenth jobs. Subjects were stopped six minutes, two minutes, four minutes, and five minutes into the four respective jobs. A value of 10 was assigned to the four minutes they had spent working on the Hand Skills Test at the beginning of the session, and the participants were asked to assign a relative value to the time they felt they had spent working on the current job.

Following completion of the maintenance task, the following measures of job perception and satisfaction were taken: the Work Scale of the Job Descriptive Index (Smith, Kendall & Hulin, 1969), the Work Itself/Work Environment Questionnaire (Cascio, 1973), and the Attribute Description Scale, developed for this research (Barrett, Bass, O'Connor, Alexander, Forbes & Cascio, 1975). Subjects in the low condition were given no information regarding performance. Those in the high condition were told that their performance was very good, above average, or average for both quantity and quality separately. This was done after all post-experimental measures had been taken.

Results

Table 1 shows the comparison of performance measures for the low job structural attribute condition and the high job structural attribute condition. The only difference approaching significance was the average time between jobs with participants in the high condition taking less time.

Manipulation checks are shown in Tables 2 and 3. For the Work Itself/Work Environment Questionnaire, shown in Table 2, both the feedback and learning new skills attributes were perceived to be significantly higher, as expected, in the high job structural attribute condition. In addition, the sum of the three manipulated attributes was significantly higher in the high condition.

Table 1

Comparison of Criteria Measures by Condition[a]

Criteria	Mean	Standard Deviation	t
Number of Jobs Completed			
High Condition	14.87	3.01	.63
Low Condition	14.33	3.49	
Average Time Per Job (seconds)			
High Condition	683.90	134.85	1.06
Low Condition	729.67	194.83	
Average Time Between Jobs (seconds)			
High Condition	14.39	6.67	1.97
Low Condition	18.77	10.16	
Work Satisfaction			
High Condition	12.93	7.58	.02
Low Condition	12.97	8.90	
Errors Correctly Detected[b]			
High Condition	4.03	1.04	.28
Low Condition	4.10	.84	

[a] n = 30 for each group.

[b] Number of errors detected as a function of number of errors available for detection.

Table 2

Descriptions on Work Itself/Work Environment by Condition[a]

	Low Condition		High Condition		
Described:	Mean	Standard Deviation	Mean	Standard Deviation	t
Responsibility	2.78	1.02	2.60	1.24	.62
Feedback	1.78	1.06	2.55	1.30	2.50**
Learning New Skills	1.37	.51	1.80	1.01	2.11*
Sum of Responsibility, Feedback, and Learning New Skills	5.93	2.07	6.95	2.58	1.68*

[a] $n = 30$ for each group.

* $p < .05$ (one-tailed test).

** $p < .01$ (one-tailed test).

Table 3

Descriptions on Attribute Description Scale by Condition[a]

Described:	Low Condition Mean	Low Condition Standard Deviation	High Condition Mean	High Condition Standard Deviation	t
Responsibility	30.27	13.65	36.67	10.39	2.04*
Feedback	25.13	9.79	29.47	8.93	1.79*
Learning New Skills	18.83	10.16	23.20	17.40	1.19
Sum of Responsibility, Feedback, and Learning New Skills	74.23	27.79	89.34	27.75	2.11*

[a] $n = 30$ for each group.

* $p < .05$ (one-tailed test).

Comparable data is shown in Table 3 for the Attribute Description Scale, indicating that responsibility, feedback, and the sum of the attributes were perceived to be significantly higher in the high condition. A comparison of Tables 2 and 3 indicates that these two instruments were differentially sensitive to the manipulated attributes.

The summary of the analysis of variance for the criterion measure of average time between jobs is presented in Table 4. A significant difference in time between jobs is shown as a function of time on the task. Examination of mean data reveals a curvilinear pattern in which participants tend to spend less time between jobs during the first and third hours.

A summary of analysis of variance for the number of jobs completed is shown in Table 5. Again, there was no significant difference between conditions, but the difference for hours was significant. Results indicate a tendency for the participants to complete fewer jobs during the third hour.

No significant differences were found in average time per job or errors correctly identified as a function of conditions, hours, or conditions by hours interactions.

The intercorrelations among the dependent measures are shown in Appendix C. As expected, the number of jobs completed was highly related to the average time taken per job.

Table 4

Analysis of Variance for Average Time Between Jobs By Condition and By Hour

Source of Variation	df	SS	MS	F
Total	179	23880.303		
Between Subjects (S)	59	14095.139		
Treatment Condition (C)	1	896.459	896.459	3.94
S within C	58	13198.680	227.563	
Within Subjects	120	9785.164		
Hours (H)	2	504.795	252.398	3.30*
C x H	2	399.045	199.523	2.61
S x H within C	116	8881.324	76.563	

* $p < .05$.

Table 5

Analysis of Variance for the Number of Jobs Completed By Condition and By Hour

Source of Variation	df	SS	MS	F
Total	179	4332.698		
Between Subjects (S)	59	3308.766		
Treatment Condition (C)	1	22.756	22.756	.40
S within C	58	3286.010	56.655	
Within S	120	1023.932		
Hours (H)	2	66.133	33.067	4.05*
C x H	2	11.379	5.689	.70
S x H within C	116	946.420	8.159	

* $p < .05$.

Relationship Between Predictors and Performance Measures by Condition

The associations among intellectual ability and total number of jobs completed are shown in Table 6. Significant relationships are found only in the low job structural attribute condition with those individuals scoring higher on both the verbal and numerical portions of the Wesman completing more jobs. As shown in Table 6, the relationships are fairly substantial. In particular, associations with the numerical score are consistantly above .5.

Measures of cognitive style were also highly related to the number of jobs completed as shown in Table 7. Thornton and Richards (1969) have demonstrated that tests scored in terms of items correct per unit time necessitate a reciprocal transformation to correct for inherent curvilinearity. This appropriate inverse transformation was applied to the Group Embedded Figures Test scores. The results in Table 7 are interesting in terms of relationship reversals as a function of manipulated task conditions. For the Rod-and-Frame Test, there was a negative relationship between total number of jobs completed and cognitive style for the low condition. This indicated, as would be expected, that those people who were most field-dependent completed the fewest number of jobs. For Group Embedded Figures Test scores, similar significant, substantial negative relationships were found in the low condition. The interesting and surprising finding depicted is that the relationships are the reverse in the high condition. The relationship was positive

Table 6

Correlations of General Intellectual Ability (Wesman)

With Number of Jobs Completed by Condition[a] and by Hour

Wesman Personnel Classification Test	Total Number of Jobs Completed	Jobs Completed (Hour One)	Jobs Completed (Hour Two)	Jobs Completed (Hour Three)
Verbal				
High Condition	.10	-.02	.23	.04
Low Condition	.42*	.37*	.37*	.40*
Numerical				
High Condition	.20	.22	.28	.07
Low Condition	.60***	.56***	.56***	.51**
Total Score				
High Condition	.17	.09	.29	.06
Low Condition	.55**	.50**	.50**	.50**

[a] n = 30 for each group.

* $p < .05$.

** $p < .01$.

** $p < .001$.

Table 7

Correlations of Cognitive Style Measures with Number of Jobs Completed by Condition[a] and by Hour

Cognitive Style Measure:	Total Number of Jobs Completed	Jobs Completed (Hour One)	Jobs Completed (Hour Two)	Jobs Completed (Hour Three)
Rod-and-Frame Test[b]				
High Condition	.13	-.18	.17	.25
Low Condition	-.40*+	-.38*	-.38*+	-.34
Embedded Figures Test (reciprocal)[b]				
High Condition	.47**#	.28	-.34	.56***≠
Low Condition	-.52**	-.54**≠	-.43*≠	-.42*≠

[a] $n = 30$ for each group.

[b] Low score more field independent

Correlation coefficients significantly different from zero:

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Correlation coefficients significantly different from each other for the two conditions:

\+ $p < .05$.

≠ $p < .01$.

\# $p < .001$.

between cognitive style and number of jobs completed. This indicated that in the high condition, the field-dependent people completed more jobs than the field-independent individuals. This finding is a reversal of expectations based on the abilities required to do the job and the obtained results found in the low condition. As shown in Table 7, several significant differences in correlation coefficients are apparent based on a comparison of the two treatments.

The relationship of the biographical information with the number of jobs completed was generally significant only for the career motivation scale in the low condition. Those with the higher career motivation completed fewer jobs (Table 8).

When the Orientation Inventory is considered, a significant negative relationship is apparent between self-orientation and the number of jobs completed, indicating that the higher the self-orientation, the fewer number of jobs completed in the low condition only (Table 9).

Table 10 shows the relationships among the Job Orientation Inventory scales and the number of jobs completed in the two conditions. Achievement (positive) and recognition (negative) appear to be good predictors for the low condition, while pay orientation is negatively related to productivity in the high condition.

The relationships among the Picture Arrangement Test scales and the number of jobs completed are shown in Table 11. In the low condition, those with the highest work failure scores tended to complete the largest number of jobs.

Table 8

Correlations of Biographical Information

With Number of Jobs Completed by Condition[a] and by Hour

Biographical Information Scale:	Total Number of Jobs Completed	Jobs Completed (Hour One)	Jobs Completed (Hour Two)	Jobs Completed (Hour Three)
Career Motivation				
High Condition	.02	-.07	-.14	.22
Low Condition	-.40*	-.45*	-.08	-.46**
Personal Relations				
High Condition	.13	.10	.05	.18
Low Condition	.08	.15	.13	-.06
Personal Effort				
High Condition	-.16	-.17	-.19	-.08
Low Condition	-.05	-.02	.04	-.14
Self-Confidence				
High Condition	.01	.05	.01	-.03
Low Condition	.01	.01	.07	-.04

[a] $n = 30$ for each group.

* $p < .05$.

** $p < .01$.

Table 9

Correlations of Orientation Inventory with

Number of Jobs Completed by Condition[a] and by Hour

Orientation Inventory Scale:	Total Number of Jobs Completed	Jobs Completed (Hour One)	Jobs Completed (Hour Two)	Jobs Completed (Hour Three)
Self-Orientation				
High Condition	-.11	.07	-.06	-.23
Low Condition	-.51**	-.51**	-.47**	-.39*
Other-Person Oriented				
High Condition	.14	.09	.05	.18
Low Condition	.39*	.37*	.35	.35
Task-Oriented				
High Condition	.05	-.13	.05	.16
Low Condition	.10	.13	.14	.02

[a] $\underline{n}$ = 30 for each group.

* $\underline{p} < .05$.

** $\underline{p} < .01$.

Table 10

Correlation of Job Orientation Inventory Scales with Number of Jobs Completed by Condition[a] and by Hour

Job Orientation Inventory Scale:	Total Number of Jobs Completed	Jobs Completed (Hour One)	Jobs Completed (Hour Two)	Jobs Completed (Hour Three)
Achievement				
High Condition	.18	.11	.03	.31
Low Condition	.36*	.41*	.27	.27
Responsibility				
High Condition	.14	.05	.16	.14
Low Condition	-.01	-.13	.10	.04
Growth				
High Condition	-.03	-.24	.03	.06
Low Condition	.18	.07	.19	.26
Recognition				
High Condition	-.07	.00	-.05	-.10
Low Condition	-.42*	-.39*	-.39*	-.37*
Status				
High Condition	-.04	-.17	-.04	.04
Low Condition	-.03	-.05	-.15	.10
Interpersonal Relations				
High Condition	.00	.14	-.02	-.06
Low Condition	-.27	-.24	-.14	-.33

Table 10

(Continued)

Job Orientation Inventory Scale:	Total Number of Jobs Completed	Jobs Completed (Hour One)	Jobs Completed (Hour Two)	Jobs Completed (Hour Three)
Pay				
High Condition	-.50**	-.41*	-.41*	-.48**
Low Condition	-.06	.05	-.21	-.05
Job Security				
High Condition	-.10	.06	-.17	-.11
Low Condition	.31	.32	.33	.19
Family				
High Condition	.26	.34	.16	.21
Low Condition	.02	.16	.02	-.16
Hobbies				
High Condition	.08	.00	.24	-.02
Low Condition	-.17	-.32	-.11	.02

[a] $n = 30$ for each group.

* $p < .05$.

** $p < .01$.

Table 11

Correlations of Picture Arrangement Test Scales With Number of Jobs Completed by Condition[a] and by Hour

Picture Arrangement Test Scale:	Total Number of Jobs Completed	Jobs Completed (Hour One)	Jobs Completed (Hour Two)	Jobs Completed (Hour Three)
Dependence				
High Condition	-.36	-.27	-.37*	-.29
Low Condition	.12	.17	-.01	.14
Sociophilia				
High Condition	.07	.05	.17	-.03
Low Condition	-.26	-.26	-.32	-.13
Self-Confidence				
High Condition	.00	-.12	.02	.05
Low Condition	.26	.23	.20	.26
Happiness				
High Condition	-.08	-.09	.04	-.14
Low Condition	-.15	-.11	-.04	-.23
Low Aggression				
High Condition	.17	.25	.09	.15
Low Condition	.08	.05	.03	.14
Work Failure				
High Condition	-.17	-.02	-.24	-.14
Low Condition	.42*	.42*	.48**	.25
Negative Work Attitude				
High Condition	-.04	-.23	-.03	.07
Low Condition	-.30	-.36	-.29	-.14

[a] $n = 28$ for each group.

* $p < .05$.

** $p < .01$.

As would be predicted, when the average time per job was correlated with the measure of general intellectual functioning, it was found that those scoring higher on the Wesman took less time per job in the low condition (Table 12). This finding did not hold in the high condition as would be expected based on Table 6.

Table 13 shows data very similar to that found in Table 7. Again, a reversal is evident across the two conditions when the Embedded Figures Test is used as a predictor of performance. For the Rod-and-Frame Test, as would be expected in the low condition, the more field-dependent people took longer per job, but no relationship was found in the high condition. As would be expected, Embedded Figures Test field-independence was associated with shorter average time per job outcomes in the low condition. For example, a .68 relationship is shown for inverse scores and total average time per job. When one considers the high job structural condition, though, a reversal is evident in the -.39 correlation between these variables, indicating that the field-dependent people are taking less time to complete the jobs. For the Embedded Figures Test inverse scores, a comparison of the correlation coefficients for the high and low conditions reveals significant differences between them at the .001 level.

Average time per job, when related to biographical information, was again associated with the career motivation scale in the low condition, as shown in Table 14. The other scales were not predictive of this outcome variable.

Table 12

Correlations of General Intellectual Ability (Wesman) with Average Time Per Job by Condition[a] and by Hour

Wesman Personnel Classification Test:	Average Time Per Job (Total)	Average Time Per Job (Hour One)	Average Time Per Job (Hour Two)	Average Time Per Job (Hour Three)
Verbal				
High Condition	-.12	.23	-.36	-.21
Low Condition	-.56***	-.61***	-.47**	-.46*
Numerical				
High Condition	-.28	-.06	-.39*	-.31
Low Condition	-.66***	-.65***	-.49**	-.61***
Total Score				
High Condition	-.21	.12	-.43*	-.29
Low Condition	-.67***	-.70***	-.54**	-.58***

[a] $n = 30$ for each group.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 13

Correlations of Cognitive Style Measures with Average Time Per Job by Condition[a] and by Hour

Cognitive Style Measure	Average Time Per Job (Total)	Average Time Per Job (Hour One)	Average Time Per Job (Hour Two)	Average Time Per Job (Hour Three)
Rod-and-Frame Test				
High Condition	.01	.29	-.08	-.08
Low Condition	.51** +	.51**	.50** +	.41*
Embedded Figures Test (reciprocal)				
High Condition	-.39* #	-.25 #	-.26 ≠	-.42* #
Low Condition	.68***	.75***	.59***	.53**

[a] $n = 30$ for each group.

Correlation coefficients significantly different from zero:

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Correlation coefficients significantly different from each other for the two conditions:

\+ $p < .05$.

≠ $p < .01$.

\# $p < .001$.

Table 14

Correlations of Biographical Information with Average Time Per Job by Condition[a] and by Hour

Biographical Inventory Scale:	Average Time Per Job (Total)	Average Time Per Job (Hour One)	Average Time Per Job (Hour Two)	Average Time Per Job (Hour Three)
Career Motivation				
High Condition	.01	.11	.15	-.18
Low Condition	.44*	.40*	.26	.48**
Personal Relations				
High Condition	-.14	-.20	.06	-.23
Low Condition	-.01	-.07	-.02	.11
Personal Effort				
High Condition	.15	.36	-.07	.09
Low Condition	.09	.13	.06	.05
Self-Confidence				
High Condition	-.04	-.09	-.03	.03
Low Condition	.02	.08	-.05	.05

[a] $n = 30$ for each group.

* $p < .05$.

** $p < .01$.

In Table 15, the relationships are shown between the Orientation Inventory scales and average time per job. In the low condition, there is a positive significant relationship for self-orientation and average time per job, indicating that those showing higher self-orientation take longer per job. No relationship is evident in the high condition. Significant differences in correlations typically exist in self-orientation predictions across conditions.

The results shown in Table 16, relating the Job Orientation Inventory and average time per job, show that the predictions are highly specific in terms of both the scales and manipulated treatments involved. Achievement and recognition orientation predict performance in the low condition but not the high condition, while pay predicts performance in the high condition but not in the low condition.

Table 17 presents the relationships among the scales of the Wesman and errors correctly identified. Consistent positive correlations in the high condition indicate that those scoring highest on the Wesman typically produce the highest quality work by correctly detecting the largest number of errors. No significant associations are evident in the low condition. These results predicting quality in the high condition only provide an interesting contrast with earlier findings (Tables 6 and 12) where the Wesman related to quantity of output only in the low condition.

Table 15

Correlations of Orientation Inventory with Average Time Per Job by Condition[a] and by Hour

Orientation Inventory Scale:	Average Time Per Job (Total)	Average Time Per Job (Hour One)	Average Time Per Job (Hour Two)	Average Time Per Job (Hour Three)
Self-Orientation				
High Condition	.05	.06	-.12	.15
Low Condition	.54**	.57***	.42*	.43*
Other-Person Oriented				
High Condition	-.11	-.13	.10	-.23
Low Condition	-.39*	-.31	-.30	-.45*
Task Oriented				
High Condition	-.04	.01	-.08	-.01
Low Condition	-.14	-.22	-.16	.04

[a] $n = 30$ in each group.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 16

Correlation of Job Orientation Inventory Scales with Average Time Per Job by Condition[a] and by Hour

Job Orientation Inventory Scale:	Average Time Per Job (Total)	Average Time Per Job (Hour One)	Average Time Per Job (Hour Two)	Average Time Per Job (Hour Three)
Achievement				
High Condition	-.12	-.14	-.01	-.12
Low Condition	-.40*	-.43*	-.26	-.32
Responsibility				
High Condition	-.16	-.04	-.20	-.13
Low Condition	.03	.20	-.09	-.10
Growth				
High Condition	.11	.37*	.04	-.06
Low Condition	-.20	-.19	-.21	-.20
Recognition				
High Condition	.01	.07	-.02	-.05
Low Condition	.47**	.38*	.51**	.44*
Status				
High Condition	.06	-.10	.22	.01
Low Condition	.09	.12	.00	.12
Interpersonal Relations				
High Condition	-.01	-.16	.04	.01
Low Condition	.18	.18	.10	.16

Table 16

(Continued)

Job Orientation Inventory Scale:	Average Time Per Job (Total)	Average Time Per Job (Hour One)	Average Time Per Job (Hour Two)	Average Time Per Job (Hour Three)
Pay				
High Condition	.47**	.44*	.36*	.40*
Low Condition	.04	-.05	.14	.11
Job Security				
High Condition	.06	-.05	.04	.11
Low Condition				
Family				
High Condition	-.29	-.32	-.12	-.26
Low Condition	.00	-.02	.03	.04
Hobbies				
High Condition	-.06	.03	-.25	.08
Low Condition	.15	.19	.11	.05

[a] $n = 30$ for each group.

* $p < .05$.

** $p < .01$.

Table 17

Correlations of General Intellectual Ability (Wesman) with Errors Correctly Identified by Condition[a] and by Hour

Wesman Personnel Classification Test:	Errors Correctly Identified (Total)	Errors Correctly Identified (Hour One)	Errors Correctly Identified (Hour Two)	Errors Correctly Identified (Hour Three)
Verbal				
High Condition	.42*	.43*	.45*	-.02
Low Condition	.15	-.20 +	.28	.31
Numerical				
High Condition	.44*	.41*	.50**	.01
Low Condition	.04	-.06	.15	.20
Total Score				
High Condition	.49**	.49**	.55**	-.01
Low Condition	.12	-.16 +	.26	.30

[a] $n = 30$ for each group.

* $p < .05$.

** $p < .01$.

+ Correlation coefficients significantly different from each other for the two conditions ($p < .05$).

Preference for Job Structural Attributes Related to Performance

As shown in Table 18, positive relationships exist in the low condition between preference for learning new skills and number of jobs completed. In this condition, individuals expressing the highest preference for learning new skills also tended to do the largest number of jobs.

The findings presented in Table 19 are similar to those shown previously in Table 18. The low condition negative correlations between learning new skills and average time per job indicate that those with the highest preferences tend to complete jobs most rapidly.

Description of Job Structural Attributes Related to Other Data

Table 20 displays the relationships between average-time-per-job measures and the way individuals described the experimental tasks they had worked on in terms of job structural attributes. In the low condition (no feedback provided), those describing the job as having the greatest feedback tended to take longer on each job. For total jobs and work during the third hour, these positive correlations were significantly different than the relationships found in the high job structural attribute condition.

In the high condition, significant positive correlations exist between work satisfaction (Table 21) and the amount of learning new skills and total job structural attributes subjects describe as present in the experimental tasks. Those who describe the task they have completed as having more of these attributes are the same individuals who indicate that

Table 18

Correlations of Attribute Preference Scale with Number of Jobs Completed by Condition[a] and by Hour

Attribute Preference Scale:	Total Number of Jobs Completed	Jobs Completed (Hour One)	Jobs Completed (Hour Two)	Jobs Completed (Hour Three)
Responsibility				
High Condition	.12	.04	.09	.16
Low Condition	-.01	.05	-.07	-.03
Learning New Skills				
High Condition	.18	.23	.21	.08
Low Condition	.38*	.38*	.40*	.27
Feedback				
High Condition	-.17	.01	-.21	-.20
Low Condition	-.12	-.05	-.04	-.22

[a] $n = 30$ for each group.

* $p < .05$.

Table 19

Correlations of Attribute Preference Scale with Average Time Per Job by Condition[a] and by Hour

Attribute Preference Scale:	Average Time Per Job (Total)	Average Time Per Job (Hour One)	Average Time Per Job (Hour Two)	Average Time Per Job (Hour Three)	Average Time Per Job (First 8 Jobs)
Responsibility					
High Condition	-.04	.03	.02	-.09	.00
Low Condition	.01	.07	.11	-.12	.00
Learning New Skills					
High Condition	-.24	-.24	-.20	-.15	-.29
Low Condition	-.49**	-.56***	-.45*	-.36	-.49**
Feedback					
High Condition	.14	.15	.08	.12	.12
Low Condition	.07	-.08	.16	.13	.03

[a] $n = 30$ for each group.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 20

Correlations of Attribute Description Scale with Average Time Per Job by Condition[a] and by Hour

Attribute Description Scale:	Average Time Per Job (Total)	Average Time Per Job (Hour One)	Average Time Per Job (Hour Two)	Average Time Per Job (Hour Three)
Responsibility				
High Condition	-.31	-.21	-.19	-.38*
Low Condition	.30	.32	.24	.32
Learning New Skills				
High Condition	-.14	-.12	.06	-.24
Low Condition	.20	.19	.20	.17
Feedback				
High Condition	-.13	-.02	-.05	-.25
Low Condition	.44*+	.36*	.33	.54**≠
Total				
High Condition	-.24	-.16	-.05	-.37*
Low Condition	.30	.29	.26	.32+

[a] $n = 30$ for each group.

Correlation coefficients significantly different from zero:

* $p < .05$.

** $p < .01$.

Correlation coefficients significantly different from each other for the two conditions:

+ $p < .05$.

≠ $p < .01$.

Table 21

Correlations of Work Satisfaction with

Attribute Description Scale by Condition[a]

Attribute Description Scale:	Work Satisfaction
Responsibility	
High Condition	.34
Low Condition	.21
Learning New Skills	
High Condition	.59***+
Low Condition	.07
Feedback	
High Condition	.06
Low Condition	.17
Total	
High Condition	.52**
Low Condition	.19

[a] $n = 30$ for each group.

** $p < .01$.

*** $p < .001$.

+ Correlation coefficients significantly different from each other for the two conditions ($p < .05$).

they are the most satisfied. No significant relationships are evident for the low condition.

Table 22 presents the correlations of the Attribute Description Scale and Wesman scores. All significant relationships are negative with higher Wesman verbal, numerical, and total intelligence scores being associated with experimental task descriptions low in responsibility, learning new skills, feedback, and the sum of these job attributes. These relationships are particularly strong for the low condition with five correlation coefficients significantly different than their high condition counterparts.

Table 23 shows three significant positive correlations between Embedded Figures Test inverse scores and the amount of job structural attributes individuals describe as being present in their experimental tasks. These correlations indicate that the more field-dependent subjects perceive the low condition task as higher in responsibility, feedback, and the sum of the manipulated dimensions.

The relationships of biographical information, Survey of Work values, and Job Orientation Inventory to Attribute Description Scales are shown in Appendix D.

Discrepancy Between Preferred and Described Job Structural Attributes Related to other Data

Table 24 presents the relationships among the Attribute Preference Scale/Attribute Description Scale absolute difference scores and the average time spent per job. Significant negative correlations exist in the low condition between average

Table 22

Correlations of Attribute Description Scale with General Intellectual Ability (Wesman) by Condition[a]

Personnel Classification Test:	Attribute Description Scale: Responsibility	Learning New Skills	Feedback	Total
Verbal				
High Condition	-.06	-.48**	-.13	-.36*
Low Condition	-.40*	-.38*	-.51**	-.40*
Numerical				
High Condition	.26 ≠	.01	.23 ≠	.18 ≠
Low Condition	-.49**	-.27	-.43**	-.45**
Total Score				
High Condition	.09 +	-.31	.03 +	-.15
Low Condition	-.49**	-.38*	-.54**	-.47**

[a] $n = 30$ for each group.

Correlation coefficients significantly different from zero:

* $p < .05$.

** $p < .01$.

Correlation coefficients significantly different from each other for the two conditions:

+ $p < .05$.

≠ $p < .01$.

Table 23

Correlations of Attribute Description Scale with Measures of Cognitive Style by Condition[a]

Cognitive Style Measures:	Attribute Description Scale: Responsibility	Learning New Skills	Feedback	Total
Rod-and-Frame Test				
High Condition	-.22	.01	.16	-.03
Low Condition	.17	.30	.19	.20
Embedded Figures Test (Reciprocal)				
High Condition	.12	.31	.24	.31
Low Condition	.50**	.30	.39*	.42

[a] $n = 30$ for each group.

* $p < .05$.

** $p < .01$.

Table 24

Correlations of Absolute Value of Attribute Description Scale Minus Attribute Preference Scale Scores with Average Time Per Job by Condition[a] and by Hour

Difference Score:	Average Time Per Job (Total)	Average Time Per Job (Hour One)	Average Time Per Job (Hour Two)	Average Time Per Job (Hour Three)
Responsibility				
High Condition	.02	.12	-.03	-.04
Low Condition	-.08	-.13	.00	-.08
Learning New Skills				
High Condition	.06	.04	-.12	.19
Low Condition	-.43*	-.45*	-.40*	-.33
Feedback				
High Condition	.15	.08	.06	.22
Low Condition	-.25	-.26	-.15	-.28
Total ADS Minus APS				
High Condition	.12	.11	-.07	.23
Low Condition	-.40*	-.44*	-.31	-.36*

[a] $n = 30$ for each group.

* $p < .05$.

time per job and both learning new skills and the total scores, indicating that those individuals with the greatest discrepancy between preferred and described job structural attributes completed their jobs most rapidly.

A significant negative correlation is found in the high condition in Table 25 between work satisfaction and the absolute difference scores for learning new skills. This correlation indicates that the larger the discrepancy between the described and preferred measures, the less the satisfaction received from the work.

Several significant relationships appear in Table 26 among Wesman Personnel Classification Test scales and the Attribute Preference Scale/Attribute Description Scale absolute difference scores. Relationships are consistently positive across conditions with higher intelligence scores being associated with larger discrepancies between described and preferred job attribute scores.

Table 27 shows that cognitive style measures are significantly related to absolute difference scores only in the low job structural attribute condition. For inverse Embedded Figures Test scores, as well as the Rod-and-Frame Test, field-independent individuals indicate the greatest discrepancy between preferences and job descriptions in terms of learning new skills and total manipulated attributes.

Appendix E contains the relationships between difference scores and both biographical and Job Orientation Inventory Scales.

Table 25

Correlations of Absolute Value of Attribute Description Scale Minus Attribute Preference Scale Scores With Work Satisfaction by Condition[a]

Difference Score	Work Satisfaction
Responsibility	
High Condition	.12
Low Condition	-.22
Learning New Skills	
High Condition	-.54**
Low Condition	.10
Feedback	
High Condition	.01
Low Condition	-.33
Total ADS Minus APS	
High Condition	-.32
Low Condition	-.17

[a] n = 30 for each group.

** $p < .01$.

Table 26

Correlations of Absolute Value of Attribute Description Scale Minus Attribute Preference Scale Scores with General Intellectual Ability (Wesman) by Condition[a]

Wesman Personnel Classification Test	Difference Score			
	Responsibility	Learning New Skills	Feedback	Total
Verbal				
High Condition	.06	.50**	.08	.40*
Low Condition	.08	.63***	.42	.61***
Numerical				
High Condition	-.10	.06	-.20	-.10
Low Condition	.14	.39	.33	.44*
Total Score				
High Condition	-.01	.36*	-.04	.22
Low Condition	.12	.60***	.43*	.60***

[a] $n = 30$ for each group.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 27

Correlations Between Absolute Value of Attribute Description Scale Minus Attribute Preference Scale Scores With Measures of Cognitive Style by Condition[a]

Cognitive Style Measure	Difference Score			
	Responsibility	Learning New Skills	Feedback	Total
Rod-and-Frame Test				
High Condition	-.12	-.06	-.19	-.18
Low Condition	-.21	-.56***	.10	-.39*
Embedded Figures Test (Reciprocal)				
High Condition	-.09	-.26	-.24	-.33
Low Condition	-.29	-.57***	-.29	-.60***

[a] n = 30 for each group.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Description of Work Itself/Work Environment Job Structural Attributes Related to Other Data

Work Itself/Work Environment described job structural attributes showed positive relationships with work satisfaction in both the high and low conditions (Table 28). These relationships indicated that those who perceived the task as higher in job structural attributes tended to be most satisfied. Similar, although weaker, relationships were evident in Table 21 between Attribute Description Scale described job structural attribute measures and work satisfaction.

The relationships between the Work Itself/Work Environment Scales and the Wesman Personnel Classification Test are highly consistent as shown in Table 29. In all significant relationships, the higher the Wesman score, the lower is the described job structural attribute measure. These relationships are expected and indicate that general intellectual ability has a decisive influence upon an individual's description of the features of a job which is objectively the same for all participants.

Table 30 shows the associations among the Orientation Inventory scales and Work Itself/Work Environment described job structural attributes. Interesting reversals take place when the Other-Person Orientation Scale is considered. In the low condition, high person orientation is typically associated with task descriptions low in job attributes, while a trend in the opposite direction is evident in the high condition.

Table 28

Correlations of Work Satisfaction with

Work Itself/Work Environment Described Job Structural Attributes

By Condition[a]

Job Attribute	Work Satisfaction
Learning New Skills	
High Condition	.42*
Low Condition	.21
Responsibility	
High Condition	.65***
Low Condition	.40*
Feedback	
High Condition	.06
Low Condition	.39*
Sum of Learning New Skills, Responsibility, and Feedback	
High Condition	.51**
Low Condition	.45*

[a] n = 30 for each group.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 29

Correlations of General Intellectual Ability (Wesman) With Work Itself/Work Environment Described Job Structural Attributes by Condition[a]

Wesman Personnel Classification Test	Job Attributes			
	Learning New Skills	Responsibility	Feedback	Sum of Learning New Skills, Responsibility, and Feedback
Verbal				
High Condition	-.39*	-.16	-.18	-.32
Low Condition	-.11	-.42*	-.16	-.32
Numerical				
High Condition	-.25	-.22	-.40*	-.40*
Low Condition	-.33*	-.22	-.29	-.34*
Total Score				
High Condition	-.39*	-.22	-.31	-.41*
Low Condition	-.22	-.38*	-.24	-.36*

[a] $n = 30$ for each group.

* $p < .05$.

Table 30

Correlations of Orientation Inventory Scales with Work Itself/Work Environment Described Job Structural Attributes By Condition[a]

Orientation Inventory Scale	Job Attribute			
	Learning New Skills	Responsibility	Feedback	Sum of Learning New Skills, Responsibility, and Feedback
Self-Orientation				
High Condition	-.22	-.17	.09	-.12
Low Condition	.26	.09	.23	.23
Other-Person Orientation				
High Condition	.32*	.34*	-.01	.28
Low Condition	-.52**≠	-.11	-.50**	-.44*≠
Task Orientation				
High Condition	-.06	-.09	.11	-.01
Low Condition	.31	.01	.24	.20

[a] $n = 30$ for each group.

* $p < .05$.

** $p < .01$.

≠ Correlation coefficients significantly different from each other for the two conditions ($p < .01$).

Absolute Differences in Work Itself/Work Environment Job Structural Attribute Scores Related to Task Outcomes

Table 31 presents the relationships between absolute differences in described minus preferred job structural attributes and time spent working on jobs. Positive correlations in the high condition indicate that those with the largest absolute discrepancies between description of and preference for learning new skills worked at the slowest rates.

Consistent, significant negative correlations in Table 32 show that those participants indicating the greatest discrepancies between described and preferred job structural attributes are the least satisfied with working on the experimental task. These relationships are evident in both the high and low conditions.

Multiple Regression Predictions of Task Performance

Table 33 shows that ability and personality/preference measures combined are better able to predict the number of jobs completed than either variable singly. In the high condition, the Job Orientation Inventory pay scale and reciprocal Embedded Figures Test scores both contribute significantly to the overall .61 prediction.

Several combinations of variables may be combined to successfully predict the number of jobs completed in the low condition. For example, when an ability measure, the Wesman total score, is combined with Work Itself/Work Environment preference for learning new skills measure, both contribute significantly to the .67 multiple R.

Table 31

Correlations of Absolute Value of Work Itself/Work Environment Described Minus Preferred Scores with Average Time Between Jobs By Condition[a] and by Hour

Difference Score:	Average Time Between Jobs (Total)	Average Time Between Jobs (Hour One)	Average Time Between Jobs (Hour Two)	Average Time Between Jobs (Hour Three)
Responsibility				
High Condition	.18	.22	.32	-.14
Low Condition	.25	.25	.15	.22
Learning New Skills				
High Condition	.42*	.37*	.24	.40*
Low Condition	.06	-.02	.01	.11
Feedback				
High Condition	-.24	-.24	.02	-.35
Low Condition	.22	.03	.18	.27
Total				
High Condition	.18	.17	.29	-.06
Low Condition	.24	.12	.18	.27

[a] n = 30 for each group.

* $p < .05$.

Table 32

Correlations of Absolute Value of Work Itself/Work Environment Described Minus Preferred Scores with Work Satisfaction By Condition[a]

Difference Score:	Work Satisfaction
Responsibility	
High Condition	-.69***
Low Condition	-.24
Learning New Skills	
High Condition	-.41*
Low Condition	-.33
Feedback	
High Condition	-.15
Low Condition	-.54**
Total	
High Condition	-.64***
Low Condition	-.48**

[a] $n = 30$ for each group.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 33

Combination of Ability and Personality/Preference Measures As Predictors of the Number of Jobs Completed by Condition[a]

Condition		Predictor	r	R	Beta	F
High	1.	Job Orientation Inventory - Pay	-.50	.50	-.40	
	2.	Embedded Figures Test	.47	.61	.36	8.07**
Low	1.	Wesman Personnel Classification Test - Total	.55	.55	.55	
	2.	Work Itself/ Work Environment Questionnaire - Preference for Learning New Skills	-.37	.67	-.38	10.77**
	1.	Embedded Figures Test (Reciprocal)	-.52	.52	-.55	
	2.	Work Itself/ Work Environment Questionnaire - Preference for Learning New Skills	-.37	.66	-.41	10.59**

[a] $n = 30$ for each group.

** $p < .01$.

Embedded Figures Test inverse scores contribute significant variance to the prediction of average time per job in the low job structural attributes condition as shown in Table 34. A .75 multiple prediction results in the low condition when the cognitive style measure is combined with the numerical scale from the Wesman. No combination of ability measures significantly increased prediction in the high condition.

When ability measures are combined with personality/preference scales, several substantial multiple correlations above .70 are achieved in the low condition (Table 35). Several predictors contribute significant variance to each of these equations.

Prediction of Maintenance Task Outcomes as a Function of Level of Work Satisfaction

Carlson, Dawis, and Weiss (1969) have presented evidence that the degree of correlation between abilities and performance will vary with satisfaction levels. It is their contention that a higher satisfaction level is indicative of a higher correlation between ability-requirement correspondence and performance. With requirements held constant in the current experiment, their position translates to a prediction of stronger ability-performance correlations when satisfaction is high. High experimental condition outcomes shown in Table 36 offer some support for this position. When Wesman scale scores are related to number of jobs completed, the correlation coefficients are always higher for those indicating above median levels of satisfaction. These differences across

Table 34

Combination of Ability Measures as Predictors of the Average Time Per Job in the Low Condition[a] Only

Condition		Predictors	r	R	Beta	F
Low	1.	Embedded Figures Test (Reciprocal)	.68	.68	.45	
	2.	Wesman Personnel Classification Test - Numerical	-.66	.75	-.38	16.86**

[a] $n = 30$ for each group.

** $p < .01$.

Table 35

Combination of Ability and Personality/Preference Measures As Predictors of Average Time Per Job in the Low Condition[a] Only

Condition		Predictor	r	R	Beta	F
Low	1.	Embedded Figures Test (Reciprocal)	.68	.68	.67	
	2.	Work Itself/ Work Environment Questionnaire - Preference for Learning New Skills	.33	.78	.28	
	3.	Survey of Work Values - Pride in Work	-.38	.82	-.28	
	4.	Work Itself/ Work Environment Questionnaire - Preference for Responsibility	.28	.85	.25	16.73**
	1.	Wesman Personnel Classification Test - Total	-.67	.67	-.67	
	2.	Work Itself/ Work Environment Questionnaire - Preference for Learning New Skills	.33	.75	.33	16.90**
	1.	Wesman Personnel Classification Test - Numerical	-.66	.66	-.54	
	2.	Job Orientation Inventory - Recognition	.47	.75	.39	
	3.	Survey of Work Values - Pride in Work	-.38	.80	-.26	14.87**

[a] $n = 30$.

** $p < .01$.

Table 36

Correlations of General Intellectual Ability (Wesman) with Number of Jobs Completed as a Function of High and Low Work Satisfaction by Condition and by Hour

	Jobs Completed (Total)	Jobs Completed (Hour One)	Jobs Completed (Hour Two)	Jobs Completed (Hour Three)
High Condition				
Wesman Verbal — High Satisfaction[a]	.57*	.59* +	.78*** ≠	.13
Wesman Verbal — Low Satisfaction[b]	-.19	-.40	-.14	-.04
Wesman Numerical — High Satisfaction[a]	.45	.41	.54*	.20
Wesman Numerical — Low Satisfaction[b]	.14	.15	.17	.08
Wesman Total — High Satisfaction[a]	.61*	.61* +	.80*** +	.19
Wesman Total — Low Satisfaction[b]	-.05	-.18	.00	.02
Low Condition				
Wesman Verbal — High Satisfaction[c]	.48	.50	.37	.47
Wesman Verbal — Low Satisfaction[c]	.30	.18	.37	.28
Wesman Numerical — High Satisfaction[c]	.68**	.67**	.67**	.58*
Wesman Numerical — Low Satisfaction[c]	.58*	.56*	.50	.47
Wesman Total — High Satisfaction[c]	.62*	.63*	.54*	.57*
Wesman Total — Low Satisfaction[c]	.50	.40	.50	.43

[a] $n = 14$. [b] $n = 16$. [c] $n = 15$.

Correlation coefficients significantly different from zero:

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Correlation coefficients significantly different from each other for those high vs. low on satisfaction:

\+ $p < .05$.

≠ $p < .01$.

conditions are significant for five of the twelve comparisons. In the low condition, the relationships between ability and performance are again higher for those participants, indicating above median levels of satisfaction, but none of these differences are significant.

While several significant correlations result when cognitive style measures are related to number of jobs completed (Table 37), none of the difference across median satisfaction splits are significant. While no pattern is evident in the high condition, a trend seems to exist in the low condition with those participants indicating above average levels of satisfaction consistently having the strongest relationships between this specific ability and performance measures.

As expected, the results in Table 38, where Wesman scores are related to average time per job performance outcomes, are similar to those reported earlier in Table 36. Correlations for those reporting above median satisfaction levels are typically, and often significantly, higher than those ability performance associations for low satisfaction participants. A clear trend again exists in the low condition with high satisfaction participants showing the strongest correlations of ability to performance, but none of these differences reached significance.

The mediating affects of satisfaction on the relationships among ability and performance measures are less clear in Tables 39 and 40. When cognitive style measures are related to average time per job performance for the high condition in Table 39,

Table 37

Correlations of Cognitive Style Measures with Number of Jobs Completed as a Function of High and Low Work Satisfaction By Condition and By Hour

	Jobs Completed (Total)	Jobs Completed (Hour One)	Jobs Completed (Hour Two)	Jobs Completed (Hour Three)
High Condition				
High Satisfaction[a] Rod-and-Frame Test	.30	.02	.20	.44
Low Satisfaction[b]	.12	-.22	.19	.26
High Satisfaction[a] Embedded Figures Test (Reciprocal)	.39	.36	.08	.55*
Low Satisfaction[b]	.70**	.28	.72**	.75***
Low Condition				
High Satisfaction[c] Rod-and-Frame Test	-.53*	-.53*	-.53*	-.44
Low Satisfaction[c]	-.05	-.01	-.01	-.11
High Satisfaction[c] Embedded Figures Test (Reciprocal)	-.68**	-.73**	-.59*	-.54*
Low Satisfaction[c]	-.43	-.48	-.11	-.46

[a] $n = 14$.

[b] $n = 16$.

[c] $n = 15$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 38

Correlations of General Intellectual Ability (Wesman) with Average Time Per Job as a Function of High and Low Work Satisfaction by Condition and by Hour

	Average Time Per Job (Total)	Average Time Per Job (Hour One)	Average Time Per Job (Hour Two)	Average Time Per Job (Hour Three)
High Condition				
Wesman Verbal				
High Satisfaction[a]	-.62*	.08	-.79***	-.57*
Low Satisfaction[b]	.21 +	.35	.17 ≠	-.03
Wesman Numerical				
High Satisfaction[a]	-.59*	-.07	-.61*	-.62*
Low Satisfaction[b]	-.21	-.07	-.25	-.34
Wesman Total				
High Satisfaction[a]	-.71**+	.02	-.84*** ≠	-.69**
Low Satisfaction[b]	.02	.18	-.02	-.19
Low Condition				
Wesman Verbal				
High Satisfaction[c]	-.65**	-.73**	-.54*	-.49
Low Satisfaction[c]	-.32	-.27	-.35	-.29
Wesman Numerical				
High Satisfaction[c]	-.74**	-.74**	-.60*	-.63*
Low Satisfaction[c]	-.58*	-.59*	-.39	-.55*
Wesman Total				
High Satisfaction[c]	-.76***	-.82***	-.63*	-.60*
Low Satisfaction[c]	-.51*	-.48	-.44	-.48

[a] $n = 14$. [b] $n = 16$. [c] $n = 15$.

Correlation coefficients significantly different from zero:

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Correlation coefficients significantly different from each other for those high vs. low on satisfaction:

\+ $p < .05$.
≠ $p < .01$.

Table 39

Correlation of Cognitive Style Measures with Average Time Per Job as a Function of High and Low Work Satisfaction By Condition and by Hour

	Average Time Per Job (Total)	Average Time Per Job (Hour One)	Average Time Per Job (Hour Two)	Average Time Per Job (Hour Three)
High Condition				
High Satisfaction[a] Rod-and-Frame Test	-.19	.11	-.24	-.20
Low Satisfaction[b]	.04	.34	-.03	-.13
High Satisfaction[a] Embedded Figures Test (Reciprocal)	-.30	-.16	-.13	-.44
Low Satisfaction[b]	-.58*	-.41	-.50	-.55*
Low Condition				
High Satisfaction[c] Rod-and-Frame Test	.63*	.59*	.69** +	.49
Low Satisfaction[c]	-.02	.07	-.04	-.09
High Satisfaction[c] Embedded Figures Test (Reciprocal)	.83***	.87***	.80*** +	.59*
Low Satisfaction[c]	.44	.62*	.15	.35

[a] $n = 14$.

[b] $n = 16$.

[c] $n = 15$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

+ Correlation coefficients significantly different from each other for those high vs. low on satisfaction ($p < .05$).

Table 40

Correlations of General Intellectual Ability (Wesman) with Errors Correctly Identified as a Function of High and Low Work Satisfaction by Condition and by Hour

	Errors Correctly Identified (Total)	Errors Correctly Identified (Hour One)	Errors Correctly Identified (Hour Two)	Errors Correctly Identified (Hour Three)
High Condition				
High Satisfaction[a] Wesman Verbal	.77***+	.75**	.76***	.13
Low Satisfaction[b] Wesman Verbal	.13	.15	.24	-.12
High Satisfaction[a] Wesman Numerical	.43	.58*	.49	-.07
Low Satisfaction[b] Wesman Numerical	.52*	.34	.58*	.07
High Satisfaction[a] Wesman Total	.74**	.79***	.77***	.06
Low Satisfaction[b] Wesman Total	.35	.27	.44	-.04
Low Condition				
High Satisfaction[c] Wesman Verbal	-.19+	-.43	.05	.18
Low Satisfaction[c] Wesman Verbal	.67**	-.14	.59*	.41
High Satisfaction[c] Wesman Numerical	-.32	-.28	-.10	.00
Low Satisfaction[c] Wesman Numerical	.21	-.34	.34	.25
High Satisfaction[c] Wesman Total	-.27+	-.42	.00	.13
Low Satisfaction[c] Wesman Total	.58*	-.27	.58*	.41

[a] $n = 14$.

[b] $n = 16$.

[c] $n = 15$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

+ Correlation coefficients significantly different from each other for those high versus low on satisfaction ($p < .05$).

the only significant correlations exist in the low satisfaction group, but no significant differences exist between satisfaction levels. In the low condition, however, a trend exists supporting the argument that the relationships of ability and performance measures are stronger for high satisfaction subjects.

The majority of comparisons, relating Wesman scores to errors correctly identified, in the high condition would seem to support the contention that associations are stronger for those with higher work satisfaction. The results in the low condition, however, offer evidence in opposition to this position. In the two comparisons where significant differences are evident across the median work satisfaction splits, the stronger relationships exist in the low condition.

Relationships Between Ability and Performance as a Function of Perceptions of Job Structural Attributes

Findings reported above seem to indicate that the relations between abilities and performance are typically stronger for those who are most satisfied. Since descriptions of job structural attributes have been shown to be positively associated with work satisfaction (Tables 21 and 28), it appeared useful to investigate whether these perceptions of task characteristics would also mediate the ability-performance relationships. It was believed that positive findings would more precisely specify aspects of tasks, namely job structural attributes, which could be given attention in order to increase the strength of ability to performance predictions.

Tables 41 through 45 present the relationships among ability measures and performance criteria as mediated by Work Itself/ Work Environment Questionnaire descriptions of job structural attributes. In Table 42, Wesman scores are related to the number of jobs completed. In the low condition, a consistent pattern is evident with associations always stronger for those describing the task as high in job structural attributes. Several significant differences in correlation coefficients are apparent across groups.

Table 42 presents the relations among cognitive style measures and the number of jobs completed. For both conditions, stronger ability-to-performance associations are shown for those describing the tasks as high in job structural attributes. Significant differences in correlation coefficients across low and high Work Itself/Work Environment groups are evident for both conditions.

When the Wesman intelligence scores are related to average time per job, in Table 43, results are similar to those presented earlier in Table 41. Those results are frequently significantly stronger for those individuals describing their tasks as high in job structural attributes. Those participants who are both most intelligent and who perceive the jobs as most enriched tend to perform best, completing tasks in the shortest average time periods.

Patterns of associations shown for cognitive style in the low condition of Table 44 are consistent with those relationships presented above. Relationships are always stronger for

Table 41

Correlations of General Intellectual Ability (Wesman) with Number of Jobs Completed as a Function of High and Low Described Job Structural Attributes (Work Itself/ Work Environment Questionnaire) by Condition and by Hour

	Jobs Completed (Total)	Jobs Completed (Hour One)	Jobs Completed (Hour Two)	Jobs Completed (Hour Three)
High Condition				
Described as High[a] Wesman Verbal	.41	.42	.51*	.20
Described as Low [a]	-.07	-.25	.03	.01
Described as High Wesman Numerical	.14	.21	.20	.03
Described as Low	.55*	.39	.61*	.44
Described as High Wesman Total	.36	.41	.47	.15
Described as Low	.21	.02	.30	.21
Low Condition				
Described as High[b] Wesman Verbal	.58*	.59*	.39	.59*
Described as Low[c]	-.05	-.34 +	.19	.10
Described as High Wesman Numerical	.72**	.73*** ≠	.61*	.63**
Described as Low	.34	.12	.43	.39
Described as High Wesman Total	.71**	.73*** ≠	.54*	.68**
Described as Low	.14	-.17	.35	.27

[a] $n = 15$. [b] $n = 16$. [c] $n = 14$.

Correlation coefficients significantly different from zero:

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Correlation coefficients significantly different from each other for those describing the job high vs. low:

\+ $p < .05$.
≠ $p < .01$.

Table 42

Correlations of Cognitive Style Measures with Number of Jobs Completed as a Function of Described Job Structural Attributes (Work Itself/Work Environment Quesionnaire) by Condition and by Hour

	Jobs Completed (Total)	Jobs Completed (Hour One)	Jobs Completed (Hour Two)	Jobs Completed (Hour Three)
High Condition				
Described as High[a] Rod-and-Frame Test	.60* +	.16	.57* +	.63* +
Described as Low[a]	-.30	-.40	-.24	-.19
Described as High[a] Embedded Figures Test (Reciprocal)	.54*	.41	.34	.61*
Described as Low[a]	.21	.06	.22	.26
Low Condition				
Described as High[b] Rod-and-Frame Test	-.59* +	-.57* ≠	-.55* +	-.52*
Described as Low[c]	.32	.47	.25	.12
Described as High[b] Embedded Figures Test (Reciprocal)	-.65**	-.65** +	-.55*	-.59*
Described as Low[c]	-.08	.16	-.07	-.01

[a] $n = 15$. [b] $n = 16$. [c] $n = 14$.

Correlation coefficients significantly different from zero:

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Correlation coefficients significantly different from each other for those describing the job as high vs. low:

\+ $p < .05$.
≠ $p < .01$.

Table 43

Correlations of General Intellectual Ability (Wesman) with Average Time Per Job as a Function of Described Job Structural Attributes (Work Itself/Work Environment Questionnaire) By Condition and By Hour

	Average Time Per Job (Total)	Average Time Per Job (Hour One)	Average Time Per Job (Hour Two)	Average Time Per Job (Hour Three)
High Condition				
Described as High[a] Wesman Verbal	-.47	.23	-.70** +	-.44
Described as Low[a] Wesman Verbal	.04	.19	.02	-.15
Described as High[a] Wesman Numerical	-.24	.17	-.41	-.27
Described as Low[a] Wesman Numerical	-.55*	.35	-.56*	-.58*
Described as High[a] Wesman Total	-.47	.25	-.72**	-.46
Described as Low[a] Wesman Total	-.23	-.05	-.25	-.37
Low Condition				
Described as High[b] Wesman Verbal	-.72** +	-.77*** +	-.59*	-.64**
Described as Low[c] Wesman Verbal	.10	.18	-.01	.00
Described as High[b] Wesman Numerical	-.75***	-.75***	-.58*	-.69**
Described as Low[c] Wesman Numerical	-.30	-.21	-.18	-.43
Described as High[b] Wesman Total	-.82*** ≠	-.86*** +	-.66**	-.74*** +
Described as Low[c] Wesman Total	.02	-.10	-.23	.08

[a] $n = 15$. [b] $n = 16$. [c] $n = 14$.

Correlation coefficients significantly different from zero:

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Correlation coefficients significantly different from each other for those describing the job as high vs. low:

\+ $p < .05$.
≠ $p < .01$.

Table 44

Correlations of Cognitive Style Measures with Average Time Per Job as a Function of Described Job Structural Attributes (Work Itself/Work Environment Questionnaire) by Condition and by Hour

	Average Time Per Job (Total)	Average Time Per Job (Hour One)	Average Time Per Job (Hour Two)	Average Time Per Job (Hour Three)
High Condition				
Described as High[a] Rod-and-Frame Test	-.54* +	-.34 ≠	-.39	-.53* +
Described as Low[a] Rod-and-Frame Test	.43	.65**	.29	.24
Described as High[a] Embedded Figures Test (Reciprocal)	-.50	-.30	-.29	-.55*
Described as Low[a] Embedded Figures Test (Reciprocal)	-.11	-.16	.02	-.15
Low Condition				
Described as High[b] Rod-and-Frame Test	.66** ≠	.61* +	.69** ≠	.60* +
Described as Low[c] Rod-and-Frame Test	-.37	-.31	-.33	-.30
Described as High[b] Embedded Figures Test (Reciprocal)	.79*** +	.82*** +	.73*** +	.68** +
Described as Low[c] Embedded Figures Test (Reciprocal)	.07	.23	-.05	-.04

[a] $n = 15$. [b] $n = 16$. [c] $n = 14$.

Correlation coefficients significantly different from zero:

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Correlation coefficients significantly different from each other for those describing the job as high vs. low:

\+ $p < .05$.
≠ $p < .01$.

those who describe the task as high in job structural attributes. In ten of these fifteen low-condition contrasts across groups, the relationships are significantly stronger for the participants describing the job as high in task attributes. Relationships in the high condition, however, are more difficult to interpret, with the Rod-and-Frame Test scores providing strong predictions in opposing directions for those describing the job as high and low in job attributes.

The relationships between intelligence and errors correctly identified are shown in Table 45. Results appear mixed. The strongest associations are seen in the high condition where participants who are high on the Wesman total score and describe the task as being high in job structural attributes tend to produce the best quality outcomes.

The Attribute Description Scale was also employed to split participants into those describing the task as high and low in job structural attributes.

Table 46 presents the association between Wesman scores and average time per job. Results are particularly strong in the low condition where those who are more intelligent and describe the job as high in structural attributes tend to work the fastest.

Table 47 shows relationships among cognitive style measures and average time per job. Results are again strongest in the low condition. Those who describe the task as high in job structural attributes exhibit the strongest relationships between cognitive style measures and performance.

Table 45

Correlations of General Intellectual Ability (Wesman) with Errors Correctly Identified as a Function of High and Low Described Job Structural Attributes (Work Itself/ Work Environment Questionnaire) by Condition and by Hour

	Errors Correctly Identified (Total)	Errors Correctly Identified (Hour One)	Errors Correctly Identified (Hour Two)	Errors Correctly Identified (Hour Three)
High Condition				
Wesman Verbal				
Described as High[a]	.56*	.59*	.61*	.19
Described as Low[a]	.19	.19	.28	-.40
Wesman Numerical				
Described as High[a]	.50	.64**	.55*	.23
Described as Low[a]	.34	.05	.46	-.45
Wesman Total				
Described as High[a]	.66**	.76***+	.72**	.25
Described as Low[a]	.28	.14	.40	-.47
Low Condition				
Wesman Verbal				
Described as High[b]	-.11	-.40	.14	.15
Described as Low[c]	.51	.29	.28	.56*
Wesman Numerical				
Described as High[b]	-.14	-.09	.02	.10
Described as Low[c]	.20	.06	.15	.26
Wesman Total				
Described as High[b]	-.13	-.31	.10	.15
Described as Low[c]	.45	.23	.27	.52

[a] $n = 15$.

[b] $n = 16$.

[c] $n = 14$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

+ Correlation coefficients significantly different from each other for those high versus low on satisfaction ($p < .05$).

Table 46

Correlations of General Intellectual Ability (Wesman) with Average Time Per Job as a Function of High and Low Described Job Structural Attributes (Attribute Description Scale) By Condition and by Hour

	Average Time Per Job (Total)	Average Time Per Job (Hour One)	Average Time Per Job (Hour Two)	Average Time Per Job (Hour Three)
High Condition				
Described as High[a] Wesman Verbal	-.34	.31	-.57	-.39
Described as Low[a]	-.14	.13	-.18	-.41
Described as High[a] Wesman Numerical	-.59*	-.22	-.59*	-.56*
Described as Low[a]	-.09	.05	-.15	-.22
Described as High[a] Wesman Total	-.55*	.12	-.72**	-.57*
Described as Low[a]	-.12	.09	-.17	-.34
Low Condition				
Described as High[b] Wesman Verbal	-.65* +	-.71** ≠	-.54*	-.52
Described as Low[c]	.15	.19	.02	.16
Described as High[b] Wesman Numerical	-.70**	-.72**	-.51	-.64*
Described as Low[c]	-.66**	-.68**	-.46	-.56*
Described as High[b] Wesman Total	-.70**	-.76**	-.56*	-.58*
Described as Low[c]	-.30	-.29	-.33	-.38

[a] $n = 15$. [b] $n = 14$. [c] $n = 16$.

Correlation coefficients significantly different from zero:

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Correlation coefficients significantly different from each other for those describing the job as high vs. low:

\+ $p < .05$.
≠ $p < .01$.

Table 47

Correlations of Cognitive Style Measures with Average Time Per Job as a Function of High and Low Described Job Structural Attributes (Attribute Description Scale) by Condition and by Hour

	Average Time Per Job (Total)	Average Time Per Job (Hour One)	Average Time Per Job (Hour Two)	Average Time Per Job (Hour Three)
High Condition				
Described as High[a] Rod-and-Frame Test	-.02	.22	-.14	-.08
Described as Low[a]	.03	.32	-.05	-.09
Described as High[a] Embedded Figures Test (Reciprocal)	-.40	-.23	-.21	-.49
Described as Low[a]	-.42	-.29	-.32	-.42
Low Condition				
Described as High[b] Rod-and-Frame Test	.64*	.72** +	.50	.49
Described as Low[c]	.32	.09	.51*	.30
Described as High[b] Embedded Figures Test (Reciprocal)	.70**	.80*** +	.59*	.51
Described as Low[c]	.42	.28	.51*	.33

[a] $n = 15$.

[b] $n = 14$.

[c] $n = 16$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

+ Correlation coefficients significantly different from each other for those describing the job as high versus low ($p < .05$).

Tables 48 and 49 present the relationships among cognitive style measures and errors correctly identified and average time between jobs, respectively. Results across both tables are mixed with significantly stronger relationships occasionally existing for both high and low Attribute Description Scale participants.

Discussion

Findings indicate that responsibility, feedback, and learning new skills were successfully manipulated. Significant differences were perceived across conditions according to both the Work Itself/Work Environment Questionnaire and the Attribute Description Scale.

As was anticipated, general intelligence, as measured by the Wesman Personnel Classification Test, was strongly related to performance in the maintenance task. An interesting pattern of relationships is evident when one examines the Wesman correlations with quantity and quality across the two treatments. The quantity of work produced, or number of jobs completed, in the maintenance task was positively related to intelligence in the low condition, while quality was positively related to intelligence in the high condition. It is possible that those low-condition participants with superior cognitive abilities concentrated their efforts on speed, while in the high condition where stress is placed upon feedback, learning new skills, and responsibility, it may be that the higher aptitude people concentrated their efforts upon the quality of the work they do.

When the specific aptitude of cognitive style was related to the number of jobs completed, a sharp reversal occurred

Table 48

Correlations of Cognitive Style Measures with Errors Correctly Identified as a Function of High and Low Described Job Structural Attributes (Attribute Description Scale) by Condition and by Hour

	Errors Correctly Identified (Total)	Errors Correctly Identified (Hour One)	Errors Correctly Identified (Hour Two)	Errors Correctly Identified (Hour Three)
High Condition				
Described as High[a] Rod-and-Frame Test	.28	.28	.40	-.02
Described as Low[a] Rod-and-Frame Test	-.49	-.25	-.62*≠	-.01
Described as High[a] Embedded Figures Test (Reciprocal)	-.06	.29	-.21	-.58*
Described as Low[a] Embedded Figures Test (Reciprocal)	-.45	-.43	-.26	-.43
Low Condition				
Described as High[b] Rod-and-Frame Test	-.33	-.26	-.17	-.50
Described as Low[c] Rod-and-Frame Test	-.01	.00	-.17	.12
Described as High[b] Embedded Figures Test (Reciprocal)	-.04	.08	-.07	-.38
Described as Low[c] Embedded Figures Test (Reciprocal)	-.04	-.16	.02	-.02

[a] $n = 15$.

[b] $n = 14$.

[c] $n = 16$.

* $p < .05$.

≠ Correlation coefficients significantly different from each other for those describing the job as high versus low ($p < .01$).

Table 49

Correlations of Cognitive Style Measures with Average Time Between Jobs as a Function of High and Low Described Job Structural Attributes (Attribute Description Scale) By Condition and by Hour

	Average Time Per Job (Total)	Average Time Per Job (Hour One)	Average Time Per Job (Hour Two)	Average Time Per Job (Hour Three)
High Condition				
Described as High[a] Rod-and-Frame Test	.07	-.07	.23	.30
Described as Low[a]	-.14	-.10	-.14	-.11
Described as High[a] Embedded Figures Test (Reciprocal)	-.28	-.18	-.20	-.34
Described as Low[a]	.18	.13	.07	.19
Low Condition				
Described as High[b] Rod-and-Frame Test	.04	.01	.07	-.01
Described as Low[c]	.26	.74*** +	.32	.05
Described as High[b] Embedded Figures Test (Reciprocal)	.06	.14	-.05	-.02
Described as Low[c]	.22	.36	.43	.04

[a] $n = 15$.

[b] $n = 14$.

[c] $n = 16$.

*** $p < .001$.

+ Correlation coefficients significantly different from each other for those describing the job as high versus low ($p < .05$).

across conditions for the Embedded Figures Test. In the low condition, the more field-independent individual performed better in terms of the quantity of his output, while this pattern was reversed in the high condition. The reversal is not easily explainable since no clear reason exists to believe that individuals, when performing identical tasks, will show reversed aptitude-performance patterns across conditions. One possible explanation might lie in the nature of the field-dependence/field-independence construct. In the high condition, the subjects were specifically told that the task was one which takes into account a number of attributes which many people typically see as very desirable. It is quite possible that the more suggestible field-dependent people were more fully convinced that these attributes were present in the high manipulation and that they therefore responded differently to the task relative to their field-independent counterparts. In contrast, field-independent participants may have failed to expend as much effort since they may not have been as convinced of the importance and the benefits to be gained from performing well.

The same reversal is found if we compare the Embedded Figures Test scores for the high and low condition with average time per job as the criterion. Again, we have extremely strong relationships in the expected direction in the low condition, but the reverse association in the high condition running counter to the hypothesized relationship between the specific cognitive style aptitude and performance.

The self-orientation scale of the Orientation Inventory was strongly related to average time per job. Those with the higher self-orientation took longer to complete the job (were least effective) in the low condition only. This may mean that in the low condition, where individuals were specifically told that the job did not entail responsibility, feedback, and learning new skills, individuals with high self-orientation felt no compulsion to attempt to do the job well. A moderate significant relationship also existed in the low condition between the interaction orientation and the average time taken to complete the jobs, indicating that those with higher interaction orientation were those who performed better on the task. This finding is not easily explained in terms of the constructs, but may be a function of the ipsative nature of the Orientation Inventory.

Numerous significant relationships existed with learning new skills throughout these results. Preference for learning new skills, for example, was associated with both less time per job and more jobs completed in the low condition. It is possible that participants, with limited perceived opportunity to learn new skills, proceeded forward rapidly giving little attention to trying to learn from the process they were involved in. A second plausible explanation for the rapid work speed of these individuals may lie in the superior abilities of those participants who expressed a preference for learning new skills. Findings indicate that these student subjects were both higher in general intellectual ability and more field-independent than their peers. Both of these general and specific abilities have

been shown earlier to substantively relate to performance quantity.

Described job structural attributes also were found to relate to performance outcomes and satisfaction. The greater the amount of attributes described to be part of the task, the more satisfaction participants tended to express. It is also interesting to note that the smaller the absolute differences between described and preferred job attributes, the greater the satisfaction of the participants. Evidence indicates that the presence of learning new skills is particularly consequential to these outcomes.

Described feedback was also seen to be significantly related to task outcomes. In the low condition, those who described the job as having the greatest amount of feedback worked the slowest on the average. Since no feedback was present in this treatment, their descriptions of the task as high in this attribute may be indicative of a lack of understanding of the task which also lead to their poorer performance.

Descriptions of the manipulated constructs, including learning new skills, can also be related to the Wesman general intelligence scores. Consistent significant negative relationships indicate that the more intelligent participants were least likely to perceive the task as possessing the manipulated job structural attributes. As would be expected, this relationship was strongest in the low condition. In general, it appears that those people who were brighter did not believe that the jobs had the attributes of learning new skills, feedback, and responsi-

bility. This may be because they correctly perceived the tasks. Alternatively, the obtained relationships may have resulted from a contrast effect. This latter explanation seems viable if one assumes that more intelligent people are typically involved in more demanding, enriched tasks and used these as their standards when judging the laboratory jobs.

It appears that participants may have turned out less work when the types of rewards they desired were not provided. For example, in the nonenriched low condition, those desiring recognition, as measured by the Job Orientation Inventory, tended to take the longest average time per job and complete the fewest tasks. Similarly, those high condition participants indicating the highest orientation toward pay also tended to produce the least amount of work.

Data supporting the Carlson et al. (1969) theory of ability to performance correlations as mediated by satisfaction scores was obtained for this sample. The majority of the comparisons across high and low satisfaction groups are consistent with the Carlson et al. (1969) findings that ability-performance correlations are stronger for highly satisfied individuals.

Recognizing the importance of satisfaction in mediating ability-performance relationships, an attempt was made to more precisely specify task characteristics which could be employed to achieve comparable outcomes. The results seem to indicate that dividing participants in terms of their descriptions of the job structural attributes possessed by tasks also provides a strong mediation of ability-performance

relationships. These findings make it possible to employ more specific task attributes, versus satisfaction in general, in attempting to identify those characteristics to be employed in examing ability-performance associations.

This study has demonstrated the strong interactive effects of perceived task characteristics and individual differences in abilities and preferences on performance and task satisfaction. A wide range of individual characteristics, as measured in this study, clearly needs to be considered by both researchers and practitioners during future job design investigations.

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Appendix A

Task Procedure Booklet

GENERAL EQUIPMENT INSTRUCTIONS

The task you are to perform is a simulation of maintenance work on complex electronics equipment. Your duties and functions will be similar to those of an Aviation Electronics Equipment Maintenance Specialist. The task consists of locating needed repairs by isolating defects in computer test runs of complex electronics equipment. Emphasis in this type of work is on identifying problem areas so that modules can be replaced rather than on the actual replacement which is accomplished by others substituting new parts for the units you indicate are defective. Your job consists of working through several stages of diagnostic information beginning with the detection of general problem symptoms and ending with the location of the most basic circuit(s) responsible for the malfunctioning of the equipment.

The computer test runs of the equipment for which you have special expertise are in the form of card decks. The first yellow card in each deck contains an identification number. Each deck is divided into four parts: a yellow "Job Identification Card," a green "Malfunction Symptoms Section," a white "Components Section," and a blue "Circuits Section."

High Job Structural Attribute Condition

Four different kinds of electronics equipment have been simulated using computer card decks. You will concentrate your work on one of these equipment types so that you can fully understand how it operates and the wide variety of malfunctions which are common to it. The existence of this diversity fortunately makes your job potentially more interesting. The nature of the simulated equipment on which you will be working and the source of each individual job is specified on the yellow "Job Identification Card" located at the front of every deck.

As time passes, you will probably find this maintenance task gets easier as you learn the problem solving skills it requires. For many of you, this job will provide a unique opportunity to learn a valuable systematic approach to problem solving. We believe the skills that you will learn can be generalized to other areas of your life and should make you more effective in solving problems which are of importance to you personally.

After training, you will have both the expertise and the test equipment needed to repair all malfunctions in the equipment you work on. Since you will have the ability to finish the whole job from beginning to end, you will be fully responsible for whether malfunctions are corrected, enabling the simulated equipment to function properly when it is tested after repair operations are completed.

Low Job Structural Attribute Condition

Although equipment decks are presented to you in their entirety, your job consists of diagnosing problems in those areas for which you have special expertise. The equipment areas for which you are responsible are designated by the Component Letters printed on the first card of your pink "Equipment Test Deck." You always do the same job following the same routine methods.

Unfortunately, because the routine repetitive nature of this task is probably unlike any that you will be involved in again, we realize that you will learn little here which will be useful to you in your personal life. It is probable that you already possess the basic skills required to perform this job and need only to become familiar with the repetitive patterns involved.

Even when you have correctly completed the work on your section of a piece of equipment, it is unfortunately still not possible for you to know if it has been restored to working order since a problem may exist in another area of specialization. Because of this, you are only partially responsible for whether equipment functions correctly after you have finished work on it.

Your performance will be evaluated in terms of the quantity and quality of your work. The most serious and costly error you can make is failing to detect a malfunctioning element which exists in an equipment deck.

Errors in your work will also be recorded (1) if you report as malfunctioning elements which are in good working order, (2) if you return an equipment deck to the finished jobs table with its elements out of the correct numeric working order, or (3) if you write down the errors that you find in such an illegible fashion that they cannot be interpreted and acted upon by the parts replacement expert.

High Job Structural Attribute Condition

As soon as all maintenance work is completed, the jobs you have worked on will be tested to determine if previously existing defective circuits have been identified. You will then be given feedback information regarding the amount and quality of your work relative to the performance of others on this job.

Low Job Structural Attribute Condition

Unfortunately, the time required to test all the equipment decks you work on and evaluate the results of the repairs you suggest is such that it will not be feasible to give you feedback regarding your performance. Although we can determine if the total equipment deck functions properly after work is completed by all specialists, it is difficult to identify which of you is at fault if it does not operate. Therefore, we will not be able to give you information regarding the success of your individual efforts.

All equipment decks will have the elements in the right working order when presented to you. Jobs to be completed should always be worked on in the exact numeric order in which they are presented to you. Specifically, you should work first on the job which is closest to you on the "Jobs to be Completed Table" to your right.

Low Job Structural Attribute Condition

When equipment decks are presented to you, they will sometimes contain message cards inserted in a vertical position. These cards indicate which other specialists have previously worked on each job. Please leave these cards in the equipment decks as you find them since they provide a list of the specialists that have previously worked on a job and a partial record of results found up to that point.

If you must, for emergency reasons, leave the room at any time, please press the number 4 button on the Response Button Console mounted on the wall before leaving your work station. When you return, please again press the number 4 button before resuming work.

Several times during you work here, the experimenter will hand you a sheet with "Time Estimation" written in big letters at the top. When this happens, you should immediately press the number 4 button on your Response Button Console, read the instructions provided, and fill in the requested information. When you have completed filling out this sheet, return it to the experimenter, again press the number 4 button on your Response Button Console, and resume work on your current job where you left off.

Appendix B

Summary of Analysis of Variance for
Average Time Per Job as a Function of
Job Structural Attribute Condition and Hours

Source of Variation	df	SS	MS	F
Total	179	7401132.49		
Between Subjects (S)	59	5449640.75		
Treatment Condition (C)	1	90602.75	90602.	.98
S within C	58	5359038.00	92397.	
Within S	120	1951491.74		
Hours (H)	2	28625.30	14312.	.89
C x H	2	72817.44	36408.	2.28
S x H within C	116	1850049.00	15948.	

Summary of Analysis of Variance for
Errors Correctly Identified as a Function of
Job Structural Attribute Condition and Hours

Source of Variation	df	SS	MS	F
Total	179	244.6567		
Between Subjects (S)	54	131.9322		
Treatment Condition (C)	1	.0451	.0451	.01
S within C	58	131.8871	2.2739	
Within S	120	112.7245		
Hours (H)	2	.3747	.1874	.19
C x H	2	.3792	.1895	.19
S x H within C	116	111.9706	.9653	

Appendix C

Correlation Matrix of Criterion Measures

For the High Treatment Condition[a]

	Number of Jobs Completed	Average Time Per Job	Average Time Between Jobs	Errors Correctly Identified
Average Time Per Job	-.97***			
Average Time Between Jobs	.14	-.23		
Errors Correctly Identified	-.33	.31	-.27	
Work Satisfaction	.21	-.26	.15	-.37*

[a] $n = 30$.

* $p < .05$.

*** $p < .001$.

Correlation Matrix of Criterion Measures

For the Low Treatment Condition[a]

	Number of Jobs Completed	Average Time Per Job	Average Time Between Jobs	Errors Correctly Identified
Average Time Per Job	-.95***			
Average Time Between Jobs	-.06	.08		
Errors Correctly Identified	-.26	.22	.28	
Work Satisfaction	.08	-.06	-.28	-.26

[a] $n = 30$.

*** $p < .001$.

Appendix D

Correlation of Attribute Description Scales (ADS) with Biographical Information by Condition[a]

Biographical Inventory Scale:	Attribute Description Scale			
	Responsibility	Learning New Skills	Feedback	Total
Career Motivation				
High Condition	.33	.43*	.40*	.52**
Low Condition	.09	.15	.24	.11
Personal Relations				
High Condition	.55**	.03	-.02	.22
Low Condition	.19	-.10	.03	.14
Personal Effort				
High Condition	.11	.11	-.25	.03
Low Condition	.32	.20	.33	.33
Self-Confidence				
High Condition	.18	.00	.07	.09
Low Condition	.06	-.16	-.03	-.12

[a] $n = 30$ for each group.

* $p < .05$.

** $p < .01$.

Correlations of Attribute Description Scales with The Survey of Work Values by Condition[a]

Survey of Work Values Scale:	Attribute Description Scale			
	Responsibility	Learning New Skills	Feedback	Total
Earnings				
High Condition	.06	.37*	-.28	.16
Low Condition	.30	-.03	.01	.31
Social Status				
High Condition	.19	.37*+	.37*+	.42**
Low Condition	.17	-.23	-.19	-.04
Upward Striving				
High Condition	.22	.14	.05	.19
Low Condition	.11	-.18	-.09	.10
Activity Preference				
High Condition	.08	.10	.10	.13
Low Condition	-.07	-.09	-.17	-.07
Job Involvement				
High Condition	.02	.17	-.01	.11
Low Condition	-.22	-.24	-.24	-.26
Pride in Work				
High Condition	.10	.08	.02	.09
Low Condition	-.22	-.24	-.33	-.33
Intrinsic				
High Condition	.09	.14	.05	.14
Low Condition	-.22	-.25	-.32	-.28

(Continued)

Survey of Work Values Scale:	Attribute Description Scale			
	Responsibility	Learning New Skills	Feedback	Total
Extrinsic				
High Condition	.16	.49**	.02	.37*
Low Condition	.28	-.14[+]	-.09	.17

[a] n = 30 for each group.

* $p < .05$.

** $p < .01$.

+ Correlation coefficients significantly different from each other for the two tasks ($p < .05$).

Correlations of Attribute Description Scales with Job Orientation Inventory Scales by Condition[a]

Job Orientation Inventory Scale:	Attribute Description Scale			
	Responsibility	Learning New Skills	Feedback	Total
Achievement				
High Condition	.24	.46**≠	.30	.48**+
Low Condition	-.02	-.30	-.30	-.19
Responsibility				
High Condition	.08	.17	.28	.23
Low Condition	.04	-.16	-.06	-.11
Growth				
High Condition	-.25	.06	.36*≠	.06
Low Condition	-.38*	-.38*	-.35	-.44*
Recognition				
High Condition	.27	.39*	-.05	.32
Low Condition	.08	.19	.35	.15
Status				
High Condition	.53**	.05	.26	.32
Low Condition	.17	-.19	-.09	-.01
Interpersonal Relations				
High Condition	-.07	-.21	.21	-.09
Low Condition	-.04	.21	.35	.08
Pay				
High Condition	-.17	-.16	-.29	-.26
Low Condition	-.06	-.18	-.15	-.02

(Continued)

Job Orientation Inventory Scale:	Attribute Description Scale			
	Responsibility	Learning New Skills	Feedback	Total
Job Security				
High Condition	-.07	-.30	-.63***	-.41*
Low Condition	-.25	.39*+	-.02+	-.05
Family				
High Condition	-.07	.28	.20	.21
Low Condition	.32	.26	.24	.48**
Hobbies				
High Condition	.28	-.52**+	-.41*	-.56***+
Low Condition	.06	.10	.01	.06

[a] $n = 30$ for each group.

Correlation coefficients significantly different from zero:

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Correlation coefficients significantly different from each other for the two conditions:

\+ $p < .01$.

≠ $p < .05$.

Appendix E

Correlations of Absolute Value of the Difference of Attribute Description Scale Minus Attribute Preference Scale with Biographical Information by Condition[a]

Biographical Inventory Scale:	Difference Score			
	Responsibility	Learning New Skills	Feedback	Total
Career Motivation				
High Condition	-.14	-.36*	-.41*	-.50**
Low Condition	-.18	-.10	-.14	-.20
Personal Relations				
High Condition	-.15	.00	-.07	-.09
Low Condition	.20	.21	-.04	.19
Personal Effort				
High Condition	-.14	-.11	.30	.03
Low Condition	.05	.10	-.35	-.07
Self-Confidence				
High Condition	-.49**	.09	-.24	-.22
Low Condition	.05	.16	-.19	.04

[a] $n = 30$ for each group.

* $p < .05$.

** $p < .01$.

Correlations of Absolute Value of the Differences of Attribute Description Scales Minus Attribute Preference Scale With the Job Orientation Inventory Scales by Condition[a]

Job Orientation Inventory Scale:	Difference Score			
	Responsibility	Learning New Skills	Feedback	Total
Achievement				
High Condition	-.38*+	-.49**#	-.20	-.57***#
Low Condition	.19	.55**	.08	.45*
Responsibility				
High Condition	-.18	-.05	-.38*	-.29
Low Condition	-.08	.08	-.23	-.08
Growth				
High Condition	.16	-.03	-.33	-.13
Low Condition	.05	.58***+	.19	.46*+
Recognition				
High Condition	-.18	-.43*	.28	-.21
Low Condition	-.07	-.42*	-.02	-.30
Status				
High Condition	-.15	.04	-.43*	-.24
Low Condition	-.07	-.42*	-.02	-.30
Interpersonal Relationships				
High Condition	-.05	.21	-.10	.08
Low Condition	.06	-.22	-.27	-.21

(Continued)

Job Orientation Inventory Scale:	Difference Score			
	Responsibility	Learning New Skills	Feedback	Total
Pay				
High Condition	.26	.09	.36*	.33
Low Condition	.27	.07	.15	.22
Job Security				
High Condition	.30	.23	.56***	.54**
Low Condition	.40	-.29	.30	.11
Family				
High Condition	.10	-.24	-.16	-.21
Low Condition	-.24	-.14	-.14	-.25
Hobbies				
High Condition	-.02	.48**	.24	.45*
Low Condition	-.10	-.01	-.01	-.06

[a] $n = 30$ for each group.

Correlation coefficients significantly different from zero:

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Correlation coefficients significantly different from each other for the two conditions:

+ $p < .05$.

# $p < .001$.